Kinship patterns and co-residence in rural Senegal: expanding longitudinal data with micro-simulations

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Research questions

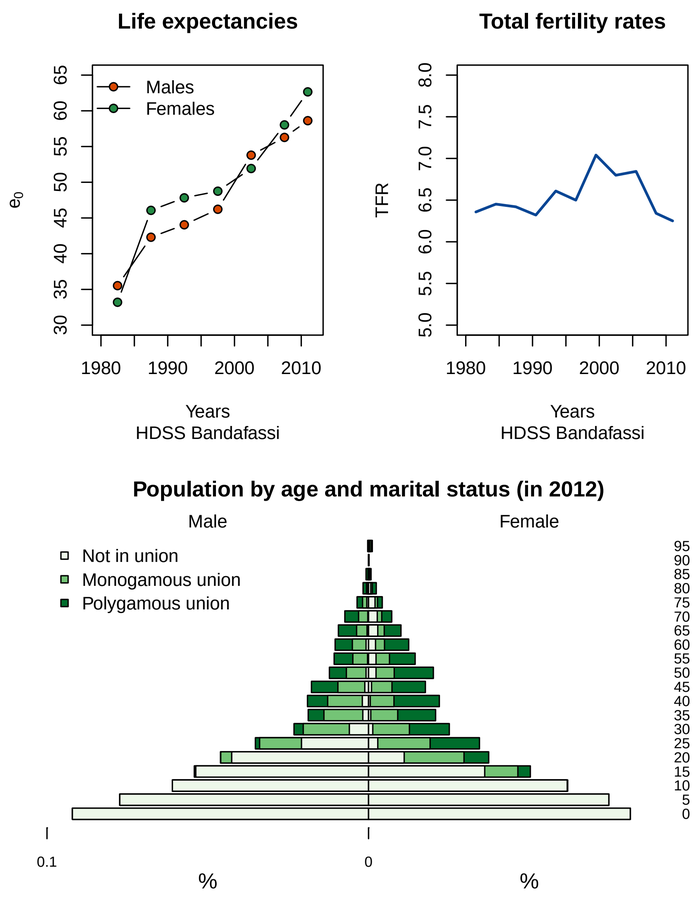
- The study of kinship structures in Africa has been central to anthropology, but few quantitative studies have been conducted because of the paucity of long series of demographic data with kinship links.
- Stochastic micro-simulations tailored to mimic the Bandafassi Health and Demographic Surveillance System (HDSS) are used to study two aspects of the kinship structures that are not fully observable:

1. How does the availability of kins evolve across the lifespan of men and women?
2. Which proportions of kins are co-resident?

The Bandafassi Demographic Site

Established in 1970, the Bandafassi HDSS covers a population of 13 000 inhabitants in south-eastern Senegal, near the borders with Mali and Guinea. The area has experienced a rapid mortality decline, but little, if any, fertility decline over the last three decades (Pison et al. 2014). Polygyny is very frequent with about 60% of married men in polygamous unions.

Fig.1: Trends in life expectancies, total fertility rate, and population pyramid in 2012, by marital status



Genealogies were collected in the HDSS at the start of the surveillance (in the 1970s). They remain incomplete because of omissions and migrations.

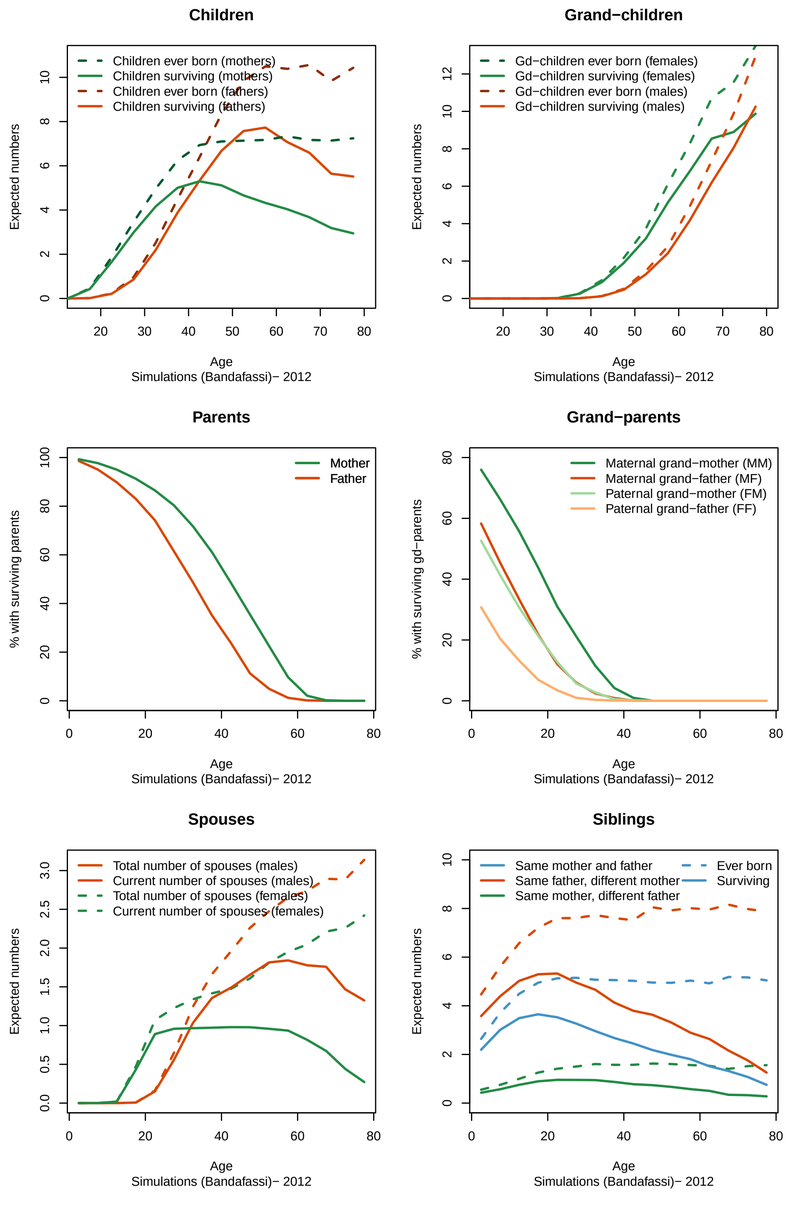
Microsimulations

- We use the SOCSIM program to generate populations that advance through time in a way that mirrors demographic trends observed in Bandafassi. The population is assumed to be stable from 1850 to 1975.
- Female fertility rates vary by age, parity and marital status; mortality rates and transitions into first marriage vary by age and sex; allowance is made for divorces, re-marriages, and polygyny.
- The waiting time until each event (birth, death, ...) is determined stochastically through a competing-risk model.

The availibility of kins over the life course

- The expected number of kins (ever born and surviving) can be computed from the simulated populations in 2012:

Fig.2:Availibility of kins of the population surviving in 2012

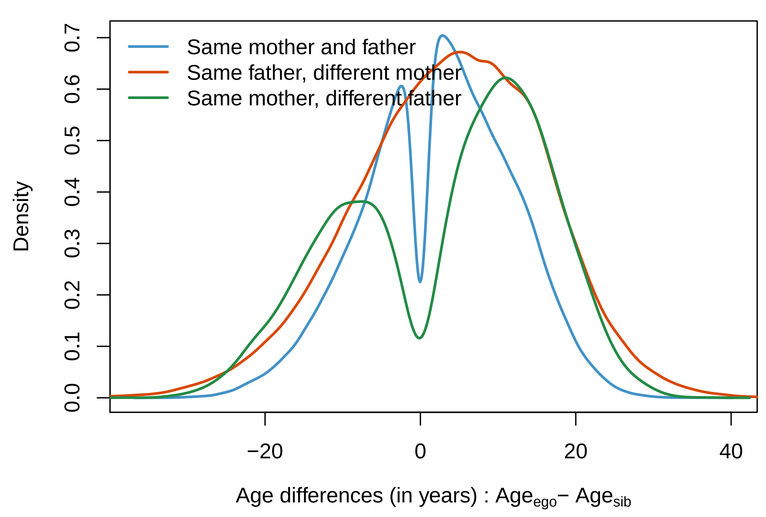


- Differences in the rate and timing of male and female reproduction lead to a definite asymmetry between the brothers' and sisters' kinship networks.
- Because of high mortality rates, the majority of adults has lost one or both parent after age 40, and apart from the maternal grand-mother, less than 20% of the other grand-parents are alive when ego reaches 20.
- High rates of divorce, widowhood and remarriage mean that adults will have more than two spouses on average in their lifetime.
- Among brothers and sisters, half-siblings born from the same father are the most numerous.

A focus on age differences between siblings

As the population is growing, each surviving individual has more younger siblings (ever born) than older ones. The variance of sibling age differences is also higher among half-siblings.

Fig.3: Sibling age differences



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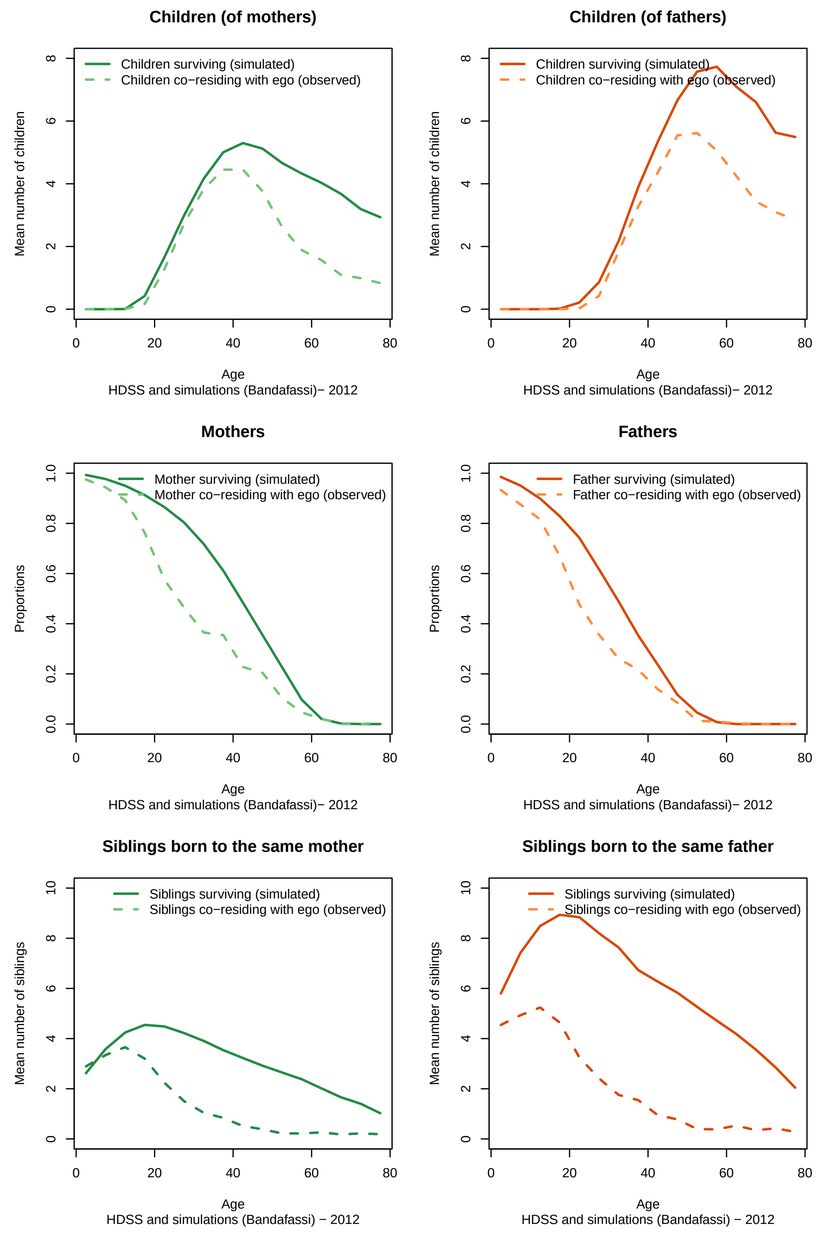
Co-residence

- The residential unit in the HDSS is a compound in which reside the members of the extended family (on average 15 people).
- The number of surviving kins (obtained from simulations) can be compared with the numbers of co-resident kins (as observed in the HDSS):

Fig.4:Expected number of surviving kins, and average number of co-resident kins



- The co-residence between parents and children is frequent, even at the adult ages.
- Individuals aged 30+ have less than one co-resident sibling born to the same mother, and less than two co-resident siblings born to the same father.
- Simulations seem to over-estimate the number of siblings born to the same father and under-estimate those born to the same mother.

Conclusions

- Our model assumes away some complexities (e.g. intergenerational correlation of fertility) but reproduces faithfully the kinship networks in the HDSS. Microsimulations are useful to represent the supply of kins and study the observed household structures.
- As observed by Howell (2008) with the !Kung population, "there are systematic differences between the genders in their place in the kinship system over their life spans, with women becoming socially central at an earlier stage of their lives than their brothers, but with men tending to hold the central positions in old age. (p. xxi)"
- The asymmetry between males and females affects the entire kin group: patrilateral kins outnumber matrilateral kins (Pison 1986).

References

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